NI 660*x* Specifications

Français Deutsch 日本語 한국어 简体中文

ni.com/manuals

This document lists specifications for the NI 660*x* devices. These specifications are typical at 25 °C unless otherwise noted. Refer to the *NI 660x User Manual* for more information about the NI 660*x* devices.

Power

Power requirement ..... 5 VDC (±5%)
- NI 6601 ..... 0.4 A to 0.75 A
- NI 6602 ..... 0.5 A to 1.5 A
- NI 6608 ..... 1 A to 2.5 A (with 1 m shielded cable as load) varies with application and OCXO warm-up period, does not include I/O power supplied through I/O connector

+5 V power available at I/O connector (pin 1) ..... +4.65 V to +5.25 V; 1 A, maximum

I/O Characteristics

Compatibility ..... TTL/CMOS

Power-on state ..... Input (high-Z) with weak pull-downs

Pull-down current ..... 10 µA min to 200 µA max

Input impedance ..... 25 kΩ to 500 kΩ

Output impedance ..... 75 Ω (56 Ω from an onboard resistor and 19 Ω from the TIO ASIC)

Hysteresis ..... 300 mV Schmitt triggers

Digital logic levels

Level	Min	Max
Input low voltage	–0.3 V	0.8 V
Input high voltage	2.0 V	Supply + 0.3 V
Input low current (V_I = 0 V)	—	–10 µA
Input high current (V_I = 5 V) – 0.3 V	—	200 µA
Output low voltage (I_{OL} = 4 mA)	—	0.4 V
Output high voltage (I_{OH} = –4 mA)	2.4 V	—

Digital I/O

Number of channels 32

Data transfer ..... Static

Handshaking ..... None

Timing I/O

Number of channels
- NI 6601 ..... 4 up/down counter/timers
- NI 6602 ..... 8 up/down counter/timers
- NI 6608 ..... 8 up/down counter/timers

Resolution ..... 32 bits

Maximum count 4,294,967,295

NATIONAL INSTRUMENTS™

Rollover times

100 kHz timebase.....11.93 h

20 MHz timebase .....214.74 s

80 MHz timebase .....53.69 s

Prescalers.....×8 or ×2 prescaler for each counter

Base clocks available

NI 6601 .....100 kHz and 20 MHz

NI 6602 .....100 kHz, 20 MHz, and 80 MHz

NI 6608 .....100 kHz, 20 MHz, and 80 MHz

Base clock accuracy

Device	Base Clock Accuracy
PCI-6601	100 ppm (±0.01%) over temperature
PCI-6602	100 ppm (±0.01%) over temperature

Device	Base Clock Accuracy	
	PXI Chassis	CompactPCI Chassis
PXI-6602	Base clock accuracy of PXI_CLK10	200 ppm (±0.02%) over temperature
PXI-6608	Base clock accuracy of PXI_CLK10[1]	200 ppm (±0.02%) over temperature

[1] 75 ppb in Slot 2. Refer to the *OCXO (NI 6608 Only)* section of this document for more information. For more information about the OCXO 10 MHz clock, refer to the *NI 660x User Manual*.

Maximum source frequency

NI 6601

Without prescaling .....20 MHz

With prescaling.....60 MHz

NI 6602

Without prescaling .....80 MHz

With prescaling.....125 MHz

NI 6608

Without prescaling .....80 MHz

With prescaling.....125 MHz

Minimum edge separation (for two edge separation measurement) .....2/maximum timebase

Data transfers

NI 6601..... DMA (1 channel), interrupts

NI 6602..... DMA (up to 3 channels), interrupts

NI 6608..... DMA (up to 3 channels), interrupts

DMA modes..... Scatter-gather

OCXO (NI 6608 Only)

Frequency..... 10.000000 MHz

Warm-up time ..... 5 minutes
(to within 20 ppb of operating frequency, power-off duration < 1 hour)

Frequency stability versus supply voltage change (±5%) ..... ±5 ppb

Temperature stability (0 °C to 50 °C) ..... ±5 ppb, reference to 25 °C

Drift in frequency..... ±0.45 ppb/day; ±45 ppb/year

Allowed frequency adjustment (to correct for drift in frequency).... ±500 ppb, typical

RTSI Trigger Lines (PCI Only)

Trigger lines <0..6> 7

RTSI clock 1

Minimum pulse width for Z index on position measurement

NI 6601..... 200 ns

NI 6602..... 50 ns

PXI Trigger Bus (PXI Only)

Trigger lines <0..5> 6

Star trigger 1

Clock..... 1

Bus Interface

All devices ..... Master, slave

Physical

Dimensions

PCI ..... 17.5 cm × 9.9 cm (6.9 in. × 3.9 in.)

PXI ..... 16.0 cm × 10.0 cm (6.3 in. × 3.9 in.)

I/O connector ..... 68-pin female, SCSI-II type

Maximum Working Voltage

Maximum working voltage refers to the signal voltage plus the common-mode voltage.

Channel-to-earth ..... ±11 V, Measurement Category I

Channel-to-channel ..... ±22 V, Measurement Category I

Caution Do not use this device for connection to signals or for measurements within Categories II, III, or IV. Refer to the *Read Me First: Safety and Electromagnetic Compatibility* document for more information about measurement categories.

Environment

The NI 660*x* devices are intended for indoor use only.

Maximum altitude ..... 2,000 meters (at 25 °C ambient temperature)

Pollution Degree 2

Operating Environment

Ambient temperature range ..... 0 °C to 55 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.)

Relative humidity range ..... 0% to 90%, noncondensing (Tested in accordance with IEC-60068-2-56.)

Storage Environment

Ambient temperature range ..... –20 °C to 70 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.)

Relative humidity range ..... 5% to 95%, noncondensing (Tested in accordance with IEC-60068-2-56.)

Shock and Vibration (PXI Only)

Operational shock ..... 30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC-60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.)

Random vibration

Operating ..... 5 Hz to 500 Hz, 0.3 grms

Nonoperating ..... 5 Hz to 500 Hz, 2.4 grms (Tested in accordance with IEC-60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Note Clean the device with a soft, non-metallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

Safety

This product meets the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

Note For EMC compliance, operate this device with shielded cables.

CE Compliance CE

This product meets the essential requirements of applicable European Directives as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at `ni.com/environment`. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit `ni.com/environment/weee`.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 `ni.com/environment/rohs_china`。(For information about China RoHS compliance, go to `ni.com/environment/rohs_china`.)

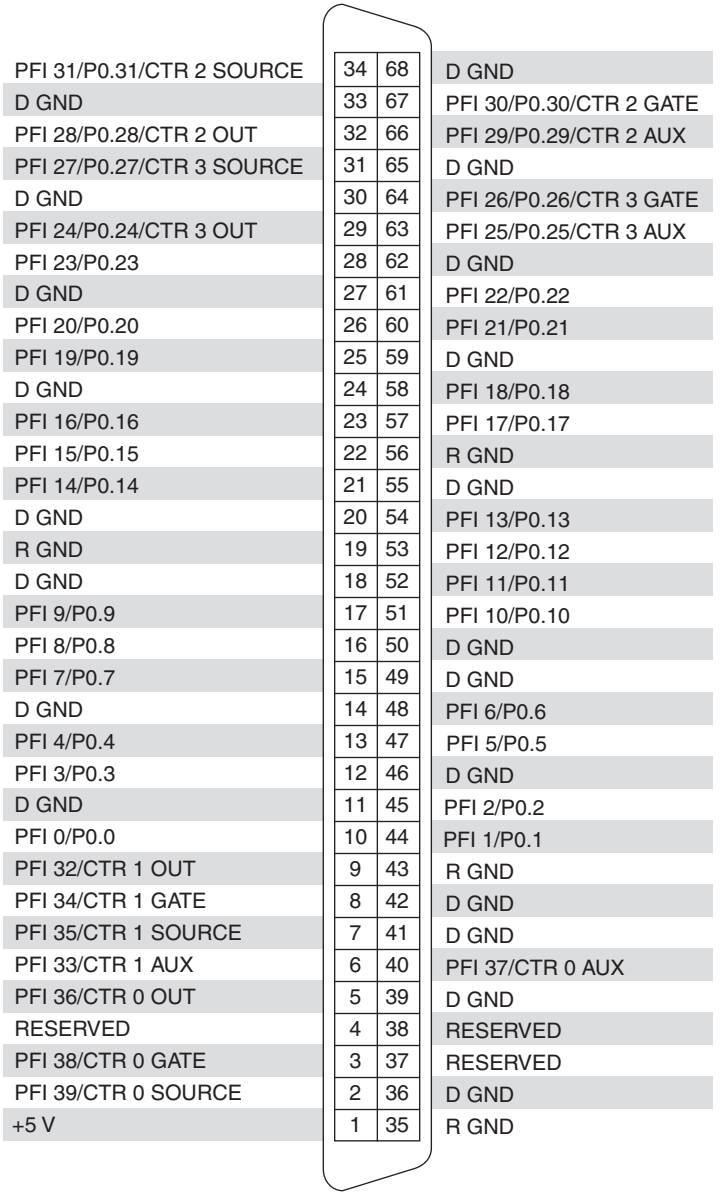
PFI 31/P0.31/CTR 2 SOURCE 34 68 D GND
D GND 33 67 PFI 30/P0.30/CTR 2 GATE
PFI 28/P0.28/CTR 2 OUT 32 66 PFI 29/P0.29/CTR 2 AUX
PFI 27/P0.27/CTR 3 SOURCE 31 65 D GND
D GND 30 64 PFI 26/P0.26/CTR 3 GATE
PFI 24/P0.24/CTR 3 OUT 29 63 PFI 25/P0.25/CTR 3 AUX
PFI 23/P0.23 28 62 D GND
D GND 27 61 PFI 22/P0.22
PFI 20/P0.20 26 60 PFI 21/P0.21
PFI 19/P0.19 25 59 D GND
D GND 24 58 PFI 18/P0.18
PFI 16/P0.16 23 57 PFI 17/P0.17
PFI 15/P0.15 22 56 R GND
PFI 14/P0.14 21 55 D GND
D GND 20 54 PFI 13/P0.13
R GND 19 53 PFI 12/P0.12
D GND 18 52 PFI 11/P0.11
PFI 9/P0.9 17 51 PFI 10/P0.10
PFI 8/P0.8 16 50 D GND
PFI 7/P0.7 15 49 D GND
D GND 14 48 PFI 6/P0.6
PFI 4/P0.4 13 47 PFI 5/P0.5
PFI 3/P0.3 12 46 D GND
D GND 11 45 PFI 2/P0.2
PFI 0/P0.0 10 44 PFI 1/P0.1
PFI 32/CTR 1 OUT 9 43 R GND
PFI 34/CTR 1 GATE 8 42 D GND
PFI 35/CTR 1 SOURCE 7 41 D GND
PFI 33/CTR 1 AUX 6 40 PFI 37/CTR 0 AUX
PFI 36/CTR 0 OUT 5 39 D GND
RESERVED 4 38 RESERVED
PFI 38/CTR 0 GATE 3 37 RESERVED
PFI 39/CTR 0 SOURCE 2 36 D GND
+5 V 1 35 R GND
RG: Reserved if using an SH68-68-D1 shielded cable. Ground if using an R6868 ribbon cable.

Figure 1. NI 6601 Pinout

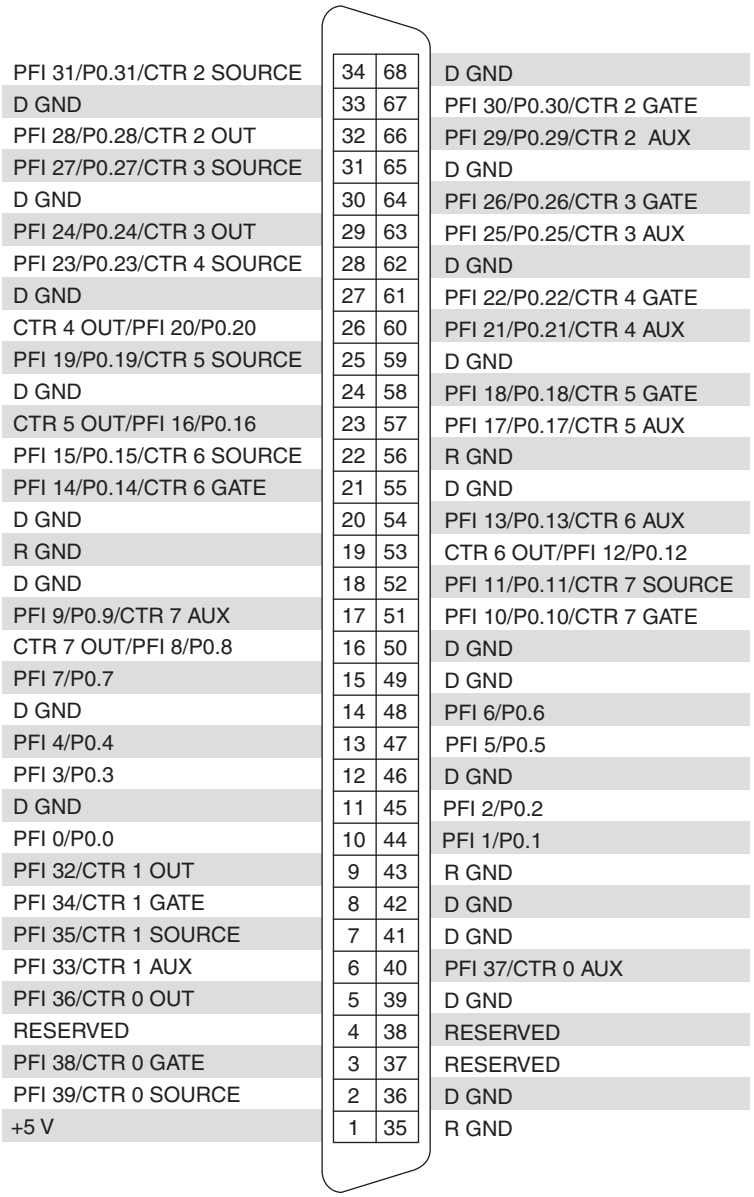

Figure 2. NI 6602/6608 Pinout

National Instruments, NI, ni.com, and LabVIEW are trademarks of National Instruments Corporation. Refer to the *Terms of Use* section on `ni.com/legal` for more information about National Instruments trademarks. Other product and company names mentioned herein are trademarks or trade names of their respective companies. For patents covering National Instruments products/technology, refer to the appropriate location: **Help»Patents** in your software, the `patents.txt` file on your media, or the *National Instruments Patent Notice* at `ni.com/patents`.

© 2006–2009 National Instruments Corporation. All rights reserved.